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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	09/096,113	HOYLER, GERNOT
	Examiner	Art Unit	
	Hugh Jones	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE **3** MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 June 1998* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-20 of U. S. Application 09/096,113, filed 6/11/1998, are pending.

Oath/Declaration

2.   The oath or declaration is defective. A new oath or declaration in compliance

with 37 CFR 1.67(a) identifying this application by application number and filing date is

required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The specification to which the oath or declaration is directed has not been

adequately identified. See MPEP § 602.

Drawings

3.   Figures 2, 8 should be designated by a legend such as --Prior Art-- because only

that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in

compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid

abandonment of the application. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct

any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

4.   Figure 2 illustrates a basic law of electromagnetism; figure 8 discloses a known

coordinate system.

Claim Rejections - 35 USC § 101

5.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6.   **Claims 1-20 are rejected under 35 U.S.C. 101 as being directed to nonstatutory subject matter since the claims as a whole do not provide for a practical application, as evidenced by lack of physical transformation or a useful, tangible, and concrete result.**

7.   Applicants are seeking patent protection for abstract ideas including basic electromagnetic field calculations (with Maxwell's equations).

8.   The 101 rejections are applied in view of the interim guidelines, MPEP sections 2106-2107 (8/2005), and *Ex Parte Bilski* (Appeal No. 2002-2257 – "informative Opinion" of the Board), all *published subsequent* to the Board decision of 11/19/2002.

9.   Claims directed to nothing more than abstract ideas (such as mathematical algorithms, software per se), natural phenomena, and laws of nature are not eligible for patent protection. While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be (MPEP, 2106).

10.   Applicants have stated (arguments 2/23/2000, page 3:

The subject matter of claims 1-20 of the present application is a method for
producing a computer simulation to identify an electromagnetic field of a body which
has a number of sub-regions containing a number of charges and currents. The end
result of the method is an identification of the electromagnetic field of the body. This
is the type of "tangible" thing which the Court of Appeals for the Federal Circuit has held
to constitute statutory subject matter, and identifying the electromagnetic field
associated with a body must unquestionably be considered a "useful" result in the
context of these decisions.

Calculating an electromagnetic field for a hypothetical object is not "useful" as
envisioned by the courts. See the specification (page 1):

> The invention relates to a computer-aided simulation method
> for determining the electromagnetic field of a body which
> comprises a plurality of subregions and contains a plurality of
> charges and currents.

11.   Consider claim 1:

> 1.   A computer-aided simulation method for determining an
> electromagnetic field of a body which has a plurality of
> subregions and contains a plurality of charges and currents,
> comprising the steps of:
>
>   performing, in each of the plurality of subregions, a global
> multipole expansion, which represents an effect of charges and
> currents for distant points in a respective subregion of the
> plurality of subregions in a multipole expansion, and a local
> multipole expansion, which represents an effect of charges and
> currents at points inside the respective subregions of the
> plurality of subregions in a multipole expansion; and
>
>   determining the electromagnetic field of the body by
> superposition using the global multipole expansion and the local
> multipole expansion for the plurality of subregions.

The claim merely recites calculating theoretical electromagnetic equations of a
hypothetical object.

12.   To satisfy 35 U.S.C. 101, an invention must be "useful." See MPEP 2107.01:

> Deficiencies under the "useful invention" requirement of 35 U.S.C. 101 will arise in one of two forms. The first is where it is not apparent why the invention is "useful." This can occur when an applicant fails to identify any _specific and substantial utility_ for the invention or fails to disclose enough information about the invention to make its usefulness immediately apparent to those familiar with the technological field of the invention. Brenner v. Manson, 383 U.S. 519, 148 USPQ 689 (1966); > In re Fisher, 421 F.3d 1365, 76 USPQ2d 1225 (Fed. Cir. 2005);< In re Ziegler, 992 F.2d 1197, 26 USPQ2d 1600 (Fed. Cir. 1993).
>
> ...
>
> A "specific utility" is _specific to the subject matter claimed_ and can "provide a well-defined and particular benefit to the public." In re Fisher, 421 F.3d 1365, 1371, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). _This contrasts with a general utility that would be applicable to the broad class of the invention._ Office personnel should distinguish between situations where an applicant has disclosed a specific use for or application of the invention and situations where the applicant merely indicates that the invention may prove useful without identifying with specificity why it is considered useful.

13.   The claimed invention is not eligible for patent protection because the claimed invention has not been limited to a substantial practical application of a 35 U.S.C. 101 judicial exception. A mere abstraction provides for no benefit in a real world situation.

14.   These issues are addressed in _Ex Parte Bilski_ (Appeal No. 2002-2257 – "informative Opinion" of the Board):

> (12) "Laws of nature" and "natural phenomena" exclusions can be explained by the fact that the "discovery" of a preexisting law of nature, a principle of physical science, or a natural phenomenon does not meet the "invents" requirement of § 101: they are not inventions "made by man," but are manifestations of nature, free to all. Id. at 1403.

Ex Parte Bilski (pg. 19)

> (13) "Abstract ideas" refer to disembodied plans, schemes, or theoretical methods. Id. at 1404. "Abstract ideas" can represent a discovery of a "law of nature" or a "physical phenomenon" or a man-made invention.' Id. Mathematical algorithms are the most well known example of an abstract idea, but there is no reason why the abstract idea exception should be

Ex Parte Bilski (pp. 20)

activity are not enough to convert an "abstract idea" into a
statutory "process." Lundgren, 76 USPQ2d at 1405 and 1427-28. A
method may not be considered an "abstract idea" if it produces an
objectively measurable result (e.g., a contract as a result of a
negotiation method or a slower heartbeat as a result of a
meditation technique), but it may still not qualify as a
"process" under § 101 if it does not perform a transformation of
physical subject matter.

Ex Parte Bilski (pp. 22)

(17) Justice Breyer in his dissent in Labcorp stated in
dicta that it is highly questionable whether the "useful,
concrete and tangible result" test is a general test for
statutory subject matter: "[State Street] does say that a process
is patentable if it produces a 'useful, concrete, and tangible

result.' 149 F.3d, at 1373. But this Court has never made such
a statement and, if taken literally, the statement would cover
instances where this Court has held the contrary." 126 S. Ct. at
2928.

Ex Parte Bilski (pp. 25-26)

idea. Thus, the State Street test requires that the practical
application must be recited in the claims. The fact that an
abstract idea is capable of being practically applied, and that a
practical application is disclosed, does not make a broad claim
to the abstract idea itself patentable. A claim which covers
both statutory and nonstatutory subject matter should be held
unpatentable, see Lundgren, 76 USPQ2d at 1417-24.

Ex Parte Bilski (pg. 39)

(2) "Abstract idea" exclusion

The subject matter of claim 1 is also directed to an "abstract idea" or, at least, it is nonstatutory because it broadly covers both a nonstatutory "abstract idea" and any specific physical implementation of it that might possibly be statutory. Claim 1 describes a plan or scheme for managing consumption risk cost in terms of a method. It is nothing but an disembodied "abstract idea" until it is instantiated in some physical way so as to become a practical application of the idea.

The steps of "initiating a series of transactions" and the step of "identifying market participants" merely describe steps or goals in the plan, and do not recite how those steps are implemented in some physical way: the steps remain disembodied. Because the steps cover ("preempt") any and every possible way of performing the steps of the plan, by human or by any kind of machine or by any combination thereof, we conclude that the claim is so broad that it is directed to the "abstract idea" itself, rather than a practical implementation of the concept. While actual physical acts of individuals or organizations would, no doubt, be required to implement the steps, and while the actual implementation of the plan in some specific way might be considered statutory subject matter, the fact that claim 1 covers both statutory and nonstatutory subject matter does not make it patentable. Thus, we further hold that claim 1 is directed to nonstatutory subject matter under the "abstract idea" exclusion.

Ex Parte Bilski (pg. 46)

(3) Useful, concrete and tangible result

We held in (1) that the claimed subject matter on appeal does not fall within the definition of a "process" under § 101 because it does not transform physical subject matter to a different state or thing, and held in (2) that it is an "abstract idea." Claim 1 does not recite a "concrete and tangible result" or a "practical application" of the hedging plan under the State Street test, because a "concrete and tangible result" is interpreted to be the opposite of an "abstract idea" and requires some sort of physical instantiation. While the plan may be "useful" in the sense of having potential utility to society, a method that has not been implemented in some specific way is not considered practically useful in a patentability sense. Even if the method is "useful," the State Street test requires the result to be "useful" and "concrete" and "tangible," so merely being "useful" is not enough. In addition, it is the result of the claimed process that must be "useful, concrete and tangible," not just one or more steps. Therefore, we also hold that claim 1 is directed to nonstatutory subject matter because it does not recite a "practical application" or produce a "concrete and tangible result" under the State Street test, to the extent that State Street applies to non-machine-implemented process claims.

Claims 2-11 are also rejected as nonstatutory subject matter because they are directed to an "abstract idea," as discussed, and do not recite a "practical application" or produce a "concrete and tangible result" under the State Street test.

Ex Parte Bilski (pp. 49-50)

The fact that the steps are not performed on a computer does not make the method nonstatutory. However, where, as here, no machine is claimed, there is no implied physical transformation of physical subject matter (e.g., electrical signals) from one state to another that would nominally indicate a statutory process (and invoke the State Street test).

Ex Parte Bilski (pg. 55)

"process" under § 101. The Board held in Lundgren that "technological arts" is not a separate and distinct test for

statutory subject matter. Although commentators have read this as eliminating a "technology" requirement for patents, this is not what was stated or intended. "The 'technology' requirement implied by 'technological arts' is contained within the definitions of the statutory classes." Lundgren. 76 USPQ2d at 1430. All "machines, manufactures, or [man-made] compositions of matter" are things made by man and involve technology. Methods which recite a transformation of physical subject matter from one state or thing to another, and which do not fall within one of the exclusions for "laws of nature, physical phenomena, and abstract ideas" involve technology and are a "process" under

§ 101. In our opinion, the statement in Musgrave that a process that can be performed mentally or by a machine is statutory subject matter as long as it is in the "technological arts" has been implicitly overruled because it has never been adopted by the Supreme Court in Gottschalk v. Benson or subsequent cases, and the CCPA and the Federal Circuit have not continued to apply this line of reasoning. A method that is so broadly claimed that it reads on performing the steps mentally should be considered an "abstract idea."

Ex Parte Bilski (pg. 58)

Appellants fail to note that the holding in State Street is clearly limited to "transformation of data ... by a machine." AT&T involved a machine-implemented process. Machines are physical things that nominally fall within the class of a "machine" in § 101, and machine-implemented methods inherently act on and transform physical subject matter, such as objects or electrical signals, and nominally fall within the definition of a "process" under § 101. No machine is required by the present claims. Until instructed otherwise, we interpret State Street

Ex Parte Bilski (pg. 59)

A general purpose computer which merely performs a mathematical algorithm (one type of abstract idea) on data, where the data is not representative of physical activity or objects, does not produce a "useful, concrete and tangible result."

Ex Parte Bilski (pg. 60)

"abstract idea." In this case, the fact that the claims are so broad that they cover ("preempt") any and every way to perform the steps indicates that what is being claimed is the "abstract idea" itself. That is, the claims read as if they are describing the concept without saying how any of the steps would be specifically implemented to produce a "real world effect." In

Ex Parte Bilski (pg. 65)

15.   Furthermore, it is clear from Applicant's arguments and the disclosure in the specification that Applicants are attempting to cover every possible practical application (namely, preemption of Maxwell's equations of electromagnetism). See MPEP 2106:

> Determine Whether the Claimed Invention Preempts a 35 U.S.C. 101 Judicial Exception (**Abstract Idea**, Law of Nature, or Natural Phenomenon)
>
> **Even when a claim applies a mathematical formula, for example, as part of a seemingly patentable process, USPTO personnel must ensure that it does not in reality "seek[]patent protection for that formula in the abstract**." Diehr, 450 U.S. at 191, 209 USPQ at 10.   .
> "Phenomena of nature, though just discovered, mental processes, abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." Benson, 409 U.S. at 67, 175 USPQ at 675. One may not patent a process that comprises every "substantial practical application" of an abstract idea, because such a patent "in practical effect would be a patent on the [abstract idea] itself." Benson, 409 U.S. at 71-72, 175 USPQ at 676; cf. Diehr, 450 U.S. at 187, 209 USPQ at 8 (stressing that the patent applicants in that case did "not seek to pre-empt the use of [an] equation," but instead sought only to "foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process"). "To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection." Diehr, 450 U.S. at 192, 209 USPQ at 10. Thus, a claim that recites a computer that solely calculates a mathematical formula (see Benson) or a computer disk that solely stores a mathematical formula is not directed to the type of subject matter eligible for patent protection. If USPTO personnel determine that the claimed invention preempts a 35 U.S.C. 101 judicial exception, **they must identify the abstraction, law of nature, or natural**

phenomenon and explain why the claim covers every substantial practical application
thereof.

Claim Rejections - 35 USC § 112

16.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

17.   Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the enablement requirement. The claim contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

There is insufficient support for determining the compatibility of a single object in the

absence of another body or, at least, in the absence of a *criterion* to judge whether the

body *would be* compatible in the presence of another body.

The rejection is incorporated by reference from the office action of 5/13/2003.

18.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

19.   Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. The term "*low* frequency" in claim 12 is a relative term which

renders the claim indefinite. The term is not defined by the claim, the specification does

not provide a standard for ascertaining the requisite degree, and one of ordinary skill in

the art would not be reasonably appraised of the scope of the invention.

Claim Rejections - 35 USC § 102

20.　　The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21.　　Claims 1, 4, 6-8, 12, 14, 19 are rejected under 35 U.S.C. 102(b) as being clearly

anticipated by Song et al. (Multilevel fast-multipole algorithm for solving combined field

integral equations of electromagnetic scattering).

22.　　Claims 1, 4, 14, 19: See "Multilevel Fast Multipole Algorithm":

4. Multilevel Fast Multipole Algorithm (MLFMA)

To implement a multilevel fast multipole algorithm (MLFMA), the entire object is first

enclosed in a large cube, which is partitioned into eight smaller cubes. Each subcube is

then recursively subdivided into smaller cubes until the edge length of the finest cube is

about half of a wavelength. Cubes at all levels are indexed. At the finest level, we find

the cube in which each basis function resides by comparing the coordinates of the center

of the basis function with the center of cube . We further find nonempty cubes by sorting.

Only nonempty cubes are recorded using tree-structured data at all levels [13,14]. Thus,

the computational cost depends only on the nonempty cubes.

The basic algorithm for matrix-vector multiply is broken down into two sweeps [15]: the

first sweep consists of constructing outer multipole expansions for each nonempty cube at

all levels. The second sweep consists of constructing local multipole expansions contributed

from the well-separated cubes at all levels. When the cube becomes larger as one progresses

from the finest level to the coarsest level, the number of multipole expansions should

increase. In the first sweep, the outer multipole expansions are computed at the finest level,

and then the expansions for larger cube are obtained using shifting and interpolation. Let

$r_{m'}$ and $r_{m'_{-1}}$ be the cube centers at level l and $l-1$, respectively; then the outer multipole

compare to claim 1, for example:

> 1.   A computer-aided simulation method for determining an
> electromagnetic field of a body which has a plurality of
> subregions and contains a plurality of charges and currents,
> comprising the steps of:
>   performing, in each of the plurality of subregions, a global
> multipole expansion, which represents an effect of charges and
> currents for distant points in a respective subregion of the
> plurality of subregions in a multipole expansion, and a local
> multipole expansion, which represents an effect of charges and
> currents at points inside the respective subregions of the
> plurality of subregions in a multipole expansion; and
>   determining the electromagnetic field of the body by
> superposition using the global multipole expansion and the local
> multipole expansion for the plurality of subregions.

6. The method according to claim 1, wherein each subregion of the plurality of subregions is

respectively assigned to a zone with uniform physical attribute. See Song et al. (page 5)

> To implement a multilevel fast multipole algorithm (MLFMA), the entire object is first
> enclosed in a large cube, which is partitioned into eight smaller cubes. Each subcube is
> then recursively subdivided into smaller cubes until the edge length of the finest cube is
> about half of a wavelength. Cubes at all levels are indexed. At the finest level, we find

7. The method according to claim I, wherein a respective subregion of the plurality of subregions

is split into up to eight zones. See Song et al. (page 5)

> To implement a multilevel fast multipole algorithm (MLFMA), the entire object is first
> enclosed in a large cube, which is partitioned into eight smaller cubes. Each subcube is
> then recursively subdivided into smaller cubes until the edge length of the finest cube is
> about half of a wavelength. Cubes at all levels are indexed. At the finest level, we find

8. The method according to claim I, wherein the electromagnetic field is determined for

predetermined frequencies (any electromagnetic calculation depends upon a frequency (even if

zero as in electrostatics); regardless, see fig. 4).

12. The method according to claim 1, wherein stability at low frequencies is ensured by carrying

out the global multipole expansions using elements (Song et al. disclose global multipole –

therefore, as defined by the claim, stability at low frequencies is insured).

Claim Rejections - 35 USC § 103

23.   The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

24.   Claims 5, 9-11, 13, 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable

over Song et al. in view of Applicant's Own Admission.

25.   Song et al. does not appear to expressly disclose the limitations of claims 5, 9-

11, 13, 16-18.

26.   Applicants have made the following admissions.

5. The method according to claim I, wherein a size of the subregions is proportional to a distance

from an observer region. This feature appears to be inherent in the basic FMM techniques.

Applicants state (page 47):

```
        According to the value of 1, the most important multipole
coefficients are customarily referred to as
                l=0: Monopole coefficient
                l=1: Dipole coefficient
                l=2: Quadripole coefficient
                l=3: Octopole coefficient
                l=4: Hexadecapole coefficient, etc.

        According to Fig. 9a and Fig. 9b, the observer region is
separated from the source region by two spherical surfaces having
radii d and D respectively. For d<<λ, the convergence of the
multipole expansions is oriented towards the static case and
depends essentially on the ratio d/D. The series converge better
the smaller the chosen value of d/D. However, in the case of a
source region which is larger in electrical terms, i.e. is of the
order of a wavelength or more, complex interference patterns are
formed, and L ≥ kd is preferably chosen in order to deal with
them.
```

also see page 5 of Song et al.:

> from the well-separated cubes at all levels. When the cube becomes larger as one progresses from the finest level to the coarsest level, the number of multipole expansions should increase. In the first sweep, the outer multipole expansions are computed at the finest level,

and:

> To implement a multilevel fast multipole algorithm (MLFMA), the entire object is first enclosed in a large cube, which is partitioned into eight smaller cubes. Each subcube is then recursively subdivided into smaller cubes until the edge length of the finest cube is <u>about half of a wavelength.</u> Cubes at all levels are indexed. At the finest level, we find

27.   As for claims 9-11, 16-18:

> wherein the predetermined frequencies are determined by a minimum frequency and by a maximum frequency, the method being started at the minimum (maximum, median) frequency and the electromagnetic field being determined for each frequency, continuing as far as the maximum or minimum frequency, with a predetermined step size. Official notice is taken that broadband applications such as EMP and other spark gap/arcing applications are studied because they may cause incompatibility (surges on oscilloscopes, etc.). For such studies a ranged of frequencies is required. Applicants admit that the order in which the frequencies are examined does not affect the claimed invention. See pg. 36:

As for claim 13, see page 1 of the application. Applicants admit this is a well known application of electromagnetic calculations.

Allowable Subject Matter

28.   Claims 2-3, 15, 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

29.   Applicant's arguments, filed 6/24/2004, have been carefully considered, but are not persuasive.

30.   Applicants argue:

> Applicant respectfully submits this is a merely re-hash of the rejection under
> Section 112, second paragraph on which the Examiner was reversed by the Board of
> Patent Appeals and Interferences. Applicant realizes the previous rejection was based
> on indefiniteness, and the present rejection is based on a lack of enablement, however,

31.   The Examiner agrees with the underlined portion. The speculation following "however" is not considered. Applicants have made no other arguments. It is noted that Applicants in the Appeal Brief refer to the following for support of the feature in question:

Page 4, line 15, Appeal Brief:

> The electromagnetic compatibility of the body is determined. (P. 4, lines 22 - 23).

page 4, lines 22-23, specification:

> The electromagnetic compatibility of the body is determined.
> In a computer-aided simulation method, the electromagnetic

There is no enabling teaching for determining compatibility of a single body.

32.   Applicants also allege, without explanation, that the applied reference is cumulative to that considered by the Board. Such argument is not considered. Regardless, the issue is moot in view of the new art rejections. Note that the new rejections are also the work of Song and Chew.

33.   Respectfully, ***Applicants are reminded that they filed for the RCE in order to have the reference considered.***

34.   **Any inquiry concerning this communication or earlier communications from the examiner should be:**

      directed to: Dr. Hugh Jones telephone number (571) 272-3781,

      Monday-Thursday 0830 to 0700 ET,

or

      the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279.

      Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

      Commissioner of Patents and Trademarks

      Washington, D.C. 20231

or faxed to:

      (703) 308-9051 (for formal communications intended for entry)

      or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

Dr. Hugh Jones

Primary Patent Examiner

September 12, 2007